

#### 4. PROPOSED AREA OF EXEMPTION

The extent of the proposed area of exemption coincides with the Area of Review (AOR) which has an irregularly-shaped boundary, as shown on Figure S-9. The AOR includes approximately 332 acres in Township 15 South Range 22 East Section 36 and Township 15 South Range 23 East Section 31. The AOR measures 3,630 feet from the northernmost to the southernmost point and 4,230 feet from the westernmost to the easternmost points. The top of the aquifer exemption zone is proposed to be the top of bedrock, and the bottom of the aquifer exemption is proposed to be the top of the sulfide zone. The approximate elevations of top of bedrock and top of sulfide within the AOR are shown on Figure S-9. The elevation of the top of the exemption varies from approximately 4600 to 4000 feet above mean sea level. The elevation of the bottom of the exemption varies from approximately 3900 to 2400 feet above mean sea level. Actual depths will be refined as drilling progresses for installation of the wellfield.

Excelsior is not requesting an aquifer exemption for the basin fill because the basin fill is not an aquifer. It does not meet the definition of an underground source of drinking water (USDW) according to 40 CFR §144.3. There are thin, isolated occurrences of saturated basin fill within the proposed AOR; thus, it does not contain a “sufficient quantity of groundwater to supply a public water system.” These occurrences of saturated basin fill are discussed below.

The absence of significant amounts of saturated basin fill within the proposed AOR was documented by Haley & Aldrich (2015) during their hydrogeologic investigation of the Project. A copy of their report is provided in Exhibit S-2. Haley & Aldrich oversaw and documented the drilling and installation of 21 hydrogeologic wells and 5 piezometers in 2014-2015 (Figure S-4). Saturated basin fill was not observed in any of the boreholes within the AOR during this drilling campaign. Groundwater was encountered in bedrock fractures, often well below the basin fill-bedrock contact. After well completion in the bedrock, groundwater rose up into the cased section within the basin fill in some of the wells (NSH-014B, NSH-016, NSH-009). These groundwater levels represent a potentiometric surface, indicating confined conditions within the bedrock aquifer.

In 2011-2012, Excelsior initiated a six-well drilling program to characterize the hydrogeology at the site. Saturated basin fill was identified in two boreholes within the AOR. Other wells were planned to be completed in the alluvium, but one well was dry, and three were cancelled when saturated alluvium was not observed during drilling of nearby bedrock wells.

The two wells (both shown on Figure S-4) in which saturated alluvium were identified were:

- NSH-006 is screened within basin fill. H&A (2015) report indicates it had 40 feet of saturated basin fill; recent water levels indicate approximately 30 feet of saturation at this well.

- NSD-020 had 30 feet of saturated basin fill at the time of installation.

Both of these wells are within a low spot on the bedrock surface that appears to be constrained by the 4,200-foot bedrock surface contour.

The sulfide zone is less fractured than the oxide zone. Excelsior conducted two aquifer tests, at NSH-014B and NSH-025, in the sulfide zone in 2015. Both tests were terminated before the scheduled end because the wells were pumped dry. A complete analysis of the aquifer testing data is provided in Attachment A-3. Drawdown in NSH-014B was 442 feet after 1.5 hours at a pumping rate of one gpm. The estimated hydraulic conductivity for NSH-014B is 0.001 ft/day. Drawdown in NSH-025 was 220 feet after one hour with pumping at a rate of four gpm. The estimated hydraulic conductivity in NSH-025 is 0.1 ft/day. Both hydraulic conductivity values are very low. Because of its low hydraulic conductivity, the sulfide zone is not feasible as an aquifer for a public water supply, and it provides a site specific control on the vertical migration of injected solutions.